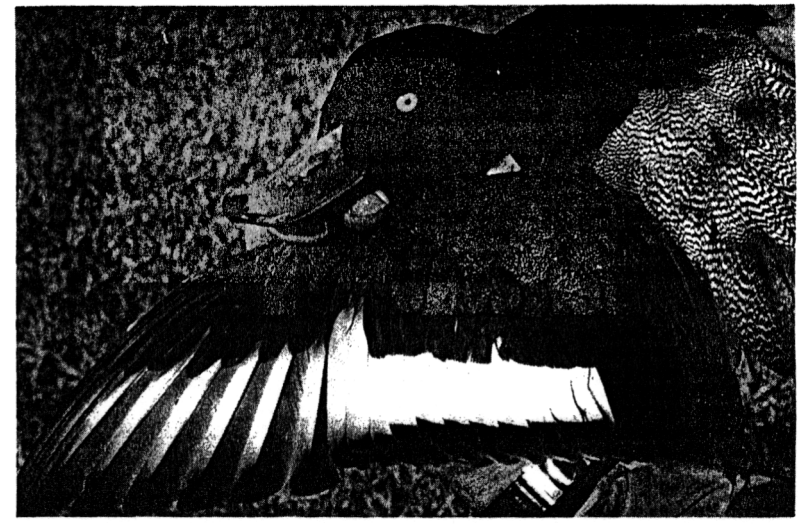
WINTER SCAUP POPULATIONS IN CONNECTICUT COASTAL WATERS

John S. Barclay[1] and James M. Zingo[1,2]

Historically, Long Island Sound has held winter populations of both Greater (*Aythya marila*) and Lesser (*A. affinis*) Scaup, but primarily Greaters that migrate from their breeding grounds in the Alaskan tundra (Figure 1). In the past, Greater Scaup have been abundant, occurring in large "rafts" on coastal waters during fall, winter, and as late as early May from Massachusetts to New Jersey, including especially Long Island Sound (Arbib et al. 1966; Bagg and Eliot 1937; Bellrose 1976; Bent 1923; Bull 1974; Chapman 1937; Connett 1947; Cruickshank 1942; Delacour 1959; Forbush 1912, 1925; Merola and Chasko 1989; Phillips and Lincoln 1930; Zeranski and Baptist 1990). Capt. Brooks, the lighthouse keeper of Falkner Island, cited by Merriam (1877), reported that there were "plenty at Guilford, Conn." In 1921, Walcott stated that Greater Scaup were "never more numerous than between 1890 and 1900." For 1948, the estimate of wintering ducks by the Connecticut warden service was 95,020 scaup of both species (Connecticut State Board of Fisheries and Game 1949). Christmas Bird Counts (CBCs) in the 1940's and 1950's along the Sound included the following: 1) an estimate of 32,000 scaup (of both species) off Stratford, Bridgeport, Fairfield, and Westport, CT on December 27, 1941 (42nd CBC); 2) 40,000, 57,529, and 32,550 Greater Scaup off western Long Island, New York in December 1952, 1953, and 1954 respectively (53rd through 55th CBC); and 3) 16,558 off Westport, CT on December 28, 1957 (58th CBC). Nichols (1957) noted "a dense raft of scaup, half a mile in length" at Orient, Long Island, NY, in February 1957. Although the wintering population in Connecticut averaged about 40,000 in the late 1950's (Merola and Chasko 1989), recent estimates indicate that only a few thousand Greater Scaup have wintered on Long Island Sound along the Connecticut coast during the past few years (data from Connecticut Department of Environmental Protection [CT DEP] midwinter waterfowl survey).

The numbers of winter scaup recorded on the U.S. Fish and Wildlife Service (USFWS) midwinter inventory have declined almost steadily for about 30 years in the following areas: 1) all flyways in the U.S. and Canada (Figure 2); the Atlantic flyway (Figure 3); the states of Massachusetts, Rhode Island, Connecticut, New York, and New Jersey combined (Figure 4); and coastal Connecticut (Figure 5) (Steiner



Adult male Greater Scaup, showing the white wing stripe which extends boldly onto the primaries and helps to distinguish this species from the similiar Lesser Scaup in flight. (Photo by G.M. Haramis)

1984, Merola and Chasko 1989). On each graph, we show the results of linear regression analysis, i.e., fitting the data to a best-fit line. All, especially Connecticut and nearby states (Figures 4 and 5), showed statistically significant correlation between population and year, with fairly strong r values (Pearson's correlation coefficient).

Relatively few Lesser Scaup winter on salt water along the North Atlantic coast, including Connecticut (Root 1988). Lessers tend to winter either further inland on freshwater or further south than Greaters (Arbib et al. 1966; Bagg and Eliot 1937; Bellrose 1976; Bent 1923; Bull 1974; CBCs; Chapman 1937; Cruickshank 1942; Delacour 1959; Forbush 1912, 1925; Hill 1965; Merola and Chasko 1989; Phillips and Lincoln 1930; USFWS harvest data). Thus the decline of wintering scaup on Long Island Sound appears to be due primarily to losses of Greater Scaup (King and Barclay in prep.). Possible explanations are that: 1) scaup populations formerly using Long Island Sound have greatly decreased in numbers; 2) these populations have moved elsewhere for the winter; or 3) both decline and relocation have occurred.

Figure 1. Greater Scaup migration pathways from their breeding grounds in western Alaska to their wintering areas (reprinted from Bellrose (1976) with permission from Stackpole Books and the Wildlife Management Institute).

Initial Investigations

Long Island Sound and New York Harbor appear to have been the major wintering areas for Greater Scaup for most of this century or longer (Bagg and Eliot 1937; Bellrose 1976; Bull 1974; all CBCs; Cruickshank 1942; Forbush 1912, 1925; Root 1988). Banding recoveries indicate that the primary breeding area is roughly 3,500 miles

(5,500 km) to the northwest, in the coastal tundra of the Kuskokwim River/Yukon River Delta, Alaska (Bellrose 1976). In this region the Lesser Scaup is relatively scarce as a breeder whereas elsewhere in Alaska and Canada, Lessers predominate and Greaters are relatively infrequent (Bent 1923; Bull 1974; Merola and Chasko 1989; Phillips and Lincoln 1930).

Estimates of the continental breeding populations for both species of scaup, and estimates for those strata (8-11) in Alaska, where most of the Greater Scaup breed, indicate stable populations, with possibly only a very slight decline, since 1955 (Figures 6 and 7). Dickson (1989) used a method called route-regression analysis to show a statistically significant upward trend in numbers of continental breeding scaup from 1955-1989, but this was done before the USFWS changed their analytical techniques in 1991 and improved the accuracy of the historic population estimates (Bortner et al. 1991).

Between 1950 and 1992 scaup numbers have declined substantially on the MWI for Connecticut waters (Figure 5). The birds have almost completely disappeared from waters west of Milford, slightly increased east of Madison, and have been somewhat stable between Milford and Madison. Observations during the winters of 1991-92 and 1992-93 revealed some use of waters in the Greenwich and Norwalk areas. Most (70% - 98%) scaup wintering in Connecticut are thought to be Greaters as indicated by CBCs, historical references, and wings of birds taken by hunters (Carney et al. 1975, 1983; Cronan 1957; Merola and Chasko 1989), as well as our own observations and specimens (N=548 for 1991-93 with 90% Greaters). Lessers occasionally may be a larger portion of the total number of scaup, depending on weather conditions and other factors (Barclay unpubl. data, Billard and Humphrey 1972; CBCs). In general, the decline appears to have been primarily the result of losses of Greater rather than Lesser Scaup. The entire set of MWI data do not indicate a major increase in Greater Scaup elsewhere in North America. Such birds might be overlooked, especially along the Canadian border, but available Canadian Wildlife Service and USFWS harvest and mid-winter survey data have not supported such a possibility thus far.

Further Investigation

Because the decline of wintering scaup in Connecticut does not appear to be due to birds switching to a new wintering area, and the breeding population of strata 8-11 seems to show only a slight decline since 1955, other factors seem to be operating. Analysis of 5632 North American band recoveries of Greater Scaup show an increasing proportion of males (currently 4:1) over the past 20 or so years

(Walker, unpubl. report; USFWS unpubl. data). Our observations of flocks in Connecticut in the winters of 1991-92 and 1992-93 show overall sex ratios of Greater Scaup of approximately 2.3 males for every female (n=336 observations and/or flocks). Furthermore, our specimen collection from the same years shows a ratio of 2.6:1 (n=492). Billard and Humphrey (1972) reported a Long Island Sound ratio of 1.2 males to females collected (n=727). A sex ratio heavily favoring males has implications for breeding ground productivity, for the number of females able to produce eggs may be a more important limiting factor than the availability of males. For the related Canvasback (*Aythya valisineria*), male and female ducklings show a significant difference in survival with males surviving nearly twice as well as females during their first 25 days (K. Kenow, pers. comm.). The Greater Scaup banding recovery data include few recent recoveries of young birds, and our specimen collection from 1991-93 showed a ratio of 7.2:1 of older-to-hatching-year birds, as compared to a ratio of 1:1.38 reported in Bellrose (1976) for hunter's bags in 1966-73 and a ratio of 2.6:1 reported in Billard and Humphrey (1972) for Connecticut. This suggests several possibilities such as 1) production of young on the breeding ground is currently low, 2) many juvenile birds are not surviving, e.g., being harvested before they reach Connecticut, or 3) more juveniles are wintering farther west, perhaps on the Great Lakes where Zebra Mussels (*Driessena polymorpha*) are abundant and readily available as a food source in winter (Graham 1990; Hebert et al. 1991; Mitchell and Carlson 1993).

Scaup generally have fed on bottom organisms such as small clams, blue mussels, and snails. However, for 1987-89, Wahle's (1990) study of foods ingested by Greater and Lesser Scaup specimens donated by hunters indicated substantial changes in diet to foods, e.g., thick-shelled gastropods, plant matter such as *Ulva lactuca*, of apparently lesser nutritive value as compared with similar earlier studies by Hoehn (1976, unpubl.) and Cronan (1957) (Table 1). If this new diet affects the health of the birds, it might also affect winter survival and the breeding success of females. If some birds are in relatively poor condition, they might be more susceptible to adverse effects from contaminants. Presumably such susceptibility could affect not only reproductive performance but also behavior and overall health (Ohlendorf et al. 1986).

A pilot study of kidney and liver tissues from 23 hunter-donated Greater Scaup, 10 Lesser Scaup, three Surf Scoters (*Melanitta perspicillata*), and seven White-winged Scoters (*M. deglandi*) from 1987-88 revealed elevated levels of cadmium in many birds, particularly adult male Greater Scaup (Tables 2 and 3). Nickel, lead, and

chromium levels were also elevated in some birds, depending on location, date, and species (Barclay et al. in prep). At the observed levels, these metals may adversely affect reproduction (Burger et al. 1990) if the birds are nutritionally stressed (Ohlendorf et al. 1986). Laboratory analysis for this pilot study was conducted by the Connecticut Agricultural Experiment Station, Hamden, CT.

Current and Future Studies

The pilot study of contaminants was expanded in 1991-92 when tissues from 90 scaup carcasses were analyzed by the Environmental Research Institute, Storrs, CT, for nine different heavy metals as well as organochlorine pesticides and polychlorinated biphenyls (PCBs) (Barclay, unpubl. data). High levels of some metals, especially cadmium, selenium, and at times, in some specimens, mercury, lead, and arsenic, were found. PCBs were significantly ($p < .001$) elevated in the adult males of both species compared to females and the pesticide DDT plus metabolites DDE and DDD were high enough in all groups to be of concern.

The preliminary results of contaminant analyses in scaup tissues prompts serious and continued concern about pollution in Long Island Sound and elsewhere. One aspect of this continuing study concerns contaminants in these ducks, not only in tissue samples but also in foods ingested (such as in gizzard contents) as well as background levels in sediments and certain marine organisms. Another aspect involves comparison of external body measurements with the masses of the abdominal fat pad and the entire body, to establish indices representing the condition of scaup as an indication of the health of these birds. Also, identifying and characterizing requirements for winter habitat and documenting flocking behavior in winter are fundamental goals of this research.

Several investigators at the University of Connecticut are helping to process data, conduct library research, measure duck specimens, remove tissue samples, study gizzard contents, evaluate habitat, and collect sediment samples. Furthermore, many Connecticut hunters have donated scaup carcasses for study, and waterfowl enthusiasts in a network of observers dubbed "Scaupnet" have voluntarily participated in surveying winter flocks. This coordinated effort to record the numbers, movements, and behavior of both scaup species is especially important to determine the status of the Greater Scaup in Long Island Sound and to pinpoint essential winter habitats for them along the Atlantic Coast.

Banding and recovery data require additional study to confirm and expand on initial conclusions concerning the sex ratios of scaup, as

well as to glean any information on the status of scaup populations. A preliminary study has been initiated using existing data provided by the USFWS. Because Greater Scaup have not been banded in Connecticut since 1969, renewal of banding might provide new insights on the long distance and local movements of those birds that occur in Long Island Sound. We have begun fieldwork in Alaska and Canada to learn more about how and where Greater Scaup are acquiring contaminants.

ACKNOWLEDGMENTS

We acknowledge with appreciation the generous contributions of time, assistance, effort, equipment, and insight provided by dozens of individuals, and regret that space precludes mention of each. We particularly note the support of individuals with the Environmental Research Institute, UCONN; and the Connecticut Department of Environmental Protection's Divisions of Wildlife, Long Island Sound Studies, Water Quality, and Law Enforcement. Special thanks also to Mr. Greg Chasko; Dr. Sally Richards, Little Harbor Laboratory; Capt. Bill Kelsey; Tom Ziobo; Dr. Robert Bendel, for statistical review; Dr. George Clark, who critiqued the manuscript; and to the many graduate and undergraduate students, staff, and volunteers in the Department of Natural Resources Management and Engineering, UCONN, and throughout the area. Funding was provided by the Connecticut DEP/LISS program, the Environmental Research Institute, and the UCONN Research Foundation, and the Department of Natural Resources Management and Engineering, UCONN.

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1. c/o Department of Natural Resources Management and Engineering, University of Connecticut, 1376 Storrs Road, Storrs, CT 06269-4087.

2. Present address: U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center, Branch of Migratory Bird Research, Laurel, MD 20708.

Table 1. Percent volume composition of Greater Scaup diets comparing results of three studies conducted in coastal Connecticut waters since 1952 (from Cronan 1957, Hoehn 1976 (unpubl.), and Wahle 1990).

Study years (sample)	Percent of diet by volume: Bivalves	Gastropods	Mollusk Fragments	Crustaceans	Fish Eggs	Plant Matter
1952-54 (n=119)	56.4	6.1	26.6	4.5	0	6.6
1975-76 (n=311)	22.0	48.7	5.0	9.0	0	15.0
1987-89 (n=52)	18.4	32.9	20.4	3.9	2.8	21.5

Table 2. Mean concentrations in parts per million dry weight of four elements in the kidneys of scaup and scoters donated by hunters from five locations along coastal Connecticut, 1987-1988.

Species	Sample size	mean ± standard error, median: Pb	Cr	Ni	Cd
Greater Scaup	23	1.38 ± 0.52	1.85 ± 0.44	31.36 ± 7.47	13.55 ± 4.52
		0.40	0.81	16.09	3.85
Lesser Scaup	10	2.22 ± 1.03	1.55 ± 0.46	22.84 ± 7.00	7.49 ± 4.32
		0.40	0.82	9.72	1.02
Surf Scoter	3	9.56 ± 3.75	1.13 ± 0.12	5.36 ± 0.43	18.88 ± 7.23
		13.73	1.20	5.16	21.54
White-winged Scoter	7	1.02 ± 0.57	4.26 ± 3.06	3.73 ± 0.36	25.14 ± 7.45
		0.40	0.65	3.42	19.94

Table 3. Mean concentrations in parts per million dry weight of four elements in the livers of scaup and scoters donated by hunters from five locations along coastal Connecticut, 1987-1988.

Species	Sample size	mean, standard error, median: Pb	Cr	Ni	Cd
Greater Scaup	23	0.81 ± 0.22	1.02 ± 0.23	15.35 ± 3.68	2.91 ± 1.09
		0.33	0.55	7.18	0.03
Lesser Scaup	10	11 ± 0.73	1.24 ± 0.36	19.16 ± 5.86	1.23 ± 0.77
		0.33	0.83	9.37	0.03
Surf Scoter	3	0.33 ± 00	.48 ± 0.17	4.98 ± 0.76	6.79 ± 2.49
		0.33	0.40	4.87	7.86
White-winged Scoter	7	1.21 ± 0.81	0.99 ± 0.23	3.85 ± 0.61	12.26 ± 3.44
		0.33	0.79	3.63	13.01

Scaupnet

There are plans to continue "Scaupnet" until June 1994, and volunteers are needed who are willing to fill out and mail in flock report forms/maps, which will be provided. If anyone is interested, they should call Graduate Research Asst. Matt Tomassone 486-0138 (office) or 684-6508 (home).

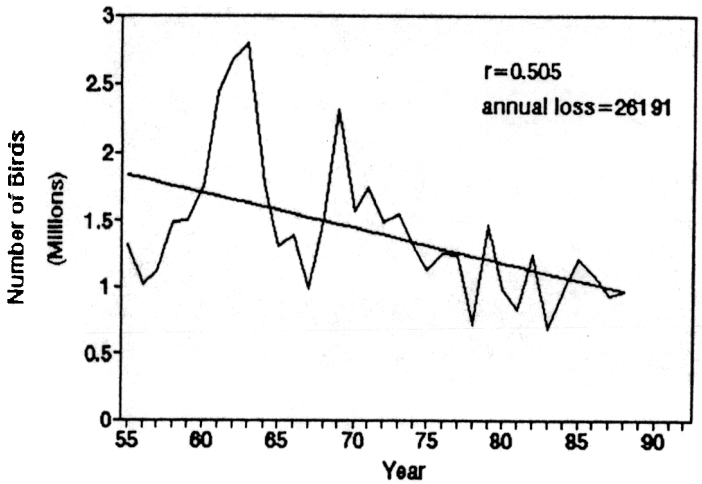


Figure 3. Scaup (both species) midwinter inventories and regression line for the Atlantic flyway, 1955-1992 (from USFWS data).

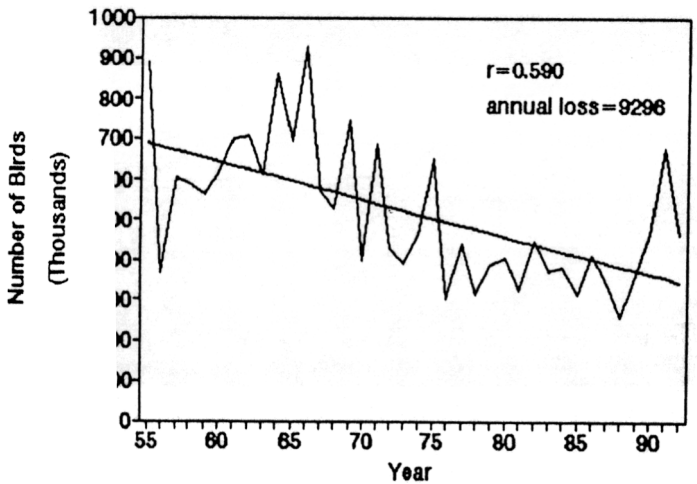


Figure 4. Scaup (both species) midwinter inventories and regression line for Massachusetts through New Jersey, 1955-1992 (from USFWS data).

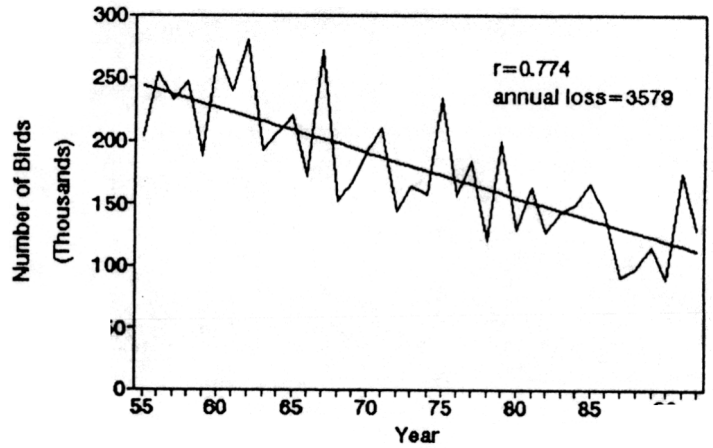


Figure 5. Scaup (both species) midwinter inventories and regression line for Connecticut, 1955-1992 (from USFWS data).

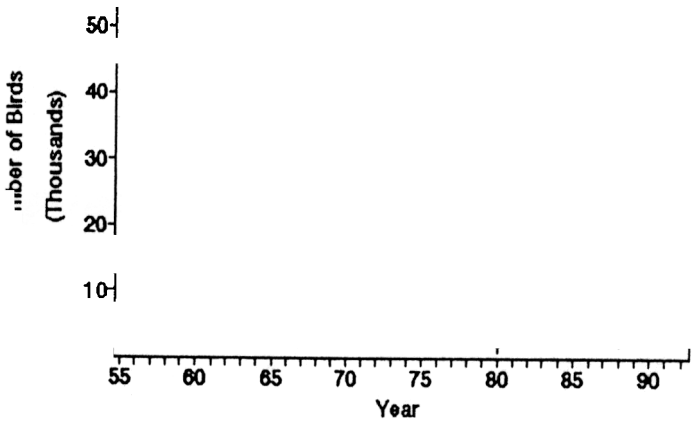


Figure 6. Scaup (both species) breeding population estimates and regression line for North America (continental, all strata), 1955-1992 (from USFWS data).

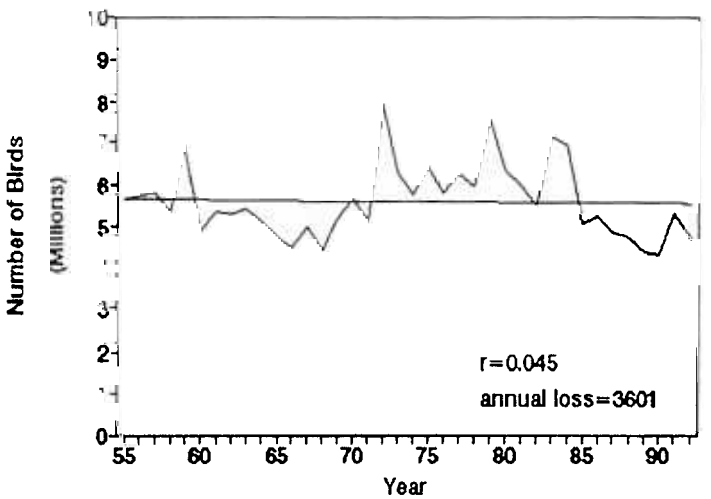
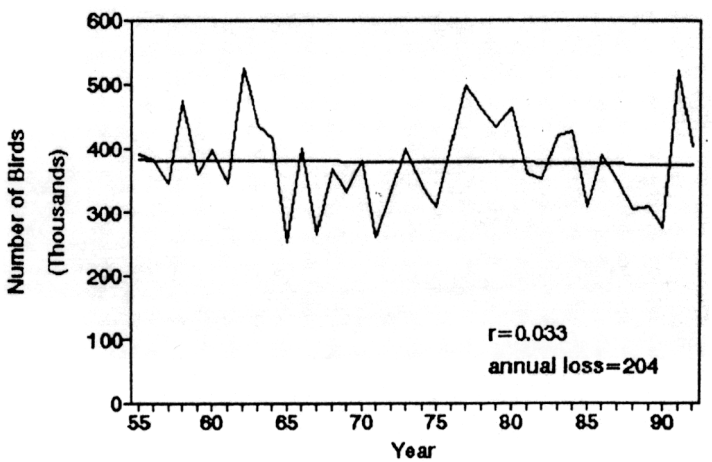


Figure 7. Scaup (both species) breeding population estimates and regression line for western Alaska (strata 8-11), 1955-1992 (from USFWS data).



CONNECTICUT FIELD NOTES SPRING: MARCH 1 - MAY 31, 1993

Jay Kaplan

Editor's Comment: Rare or unusal bird species sighted in Connecticut (see COA Field List) require that documentation be submitted to the Secretary of the Rare Records Committee, if they are to be included in the Connecticut Field Notes.

This is the first seasonal report to be compiled using the new reporting forms. Contributors may be interested to know that this is the system that is now used in Massachusetts. As with any new venture, there is certain to be a "transition" period, and this is certainly the case with this new method of compiling data. Although many contributors have switched to the new report form, there remains a substantial number of birders using old forms or blank sheets of paper on which they are forwarding their observations. As a result, errors and omissions become more likely and the editors apologize for any glaring mistakes that may follow in this seasonal report. It is our hope that in the final analysis, the new report forms will make seasonal compilation easier and more accurate. Contributors who have concerns, questions, or suggestions with regard to this new system, should not hesitate to contact the author of this column or the editor of The Connecticut Warbler prior to the publication of the next issue. Packets of the new report forms are available by contacting the editor.

The spring season provided some early excitement as a "blizzard" March 13th dumped up to two feet of snow on coastal Connecticut, and three to four feet inland. Continued cold temperatures for the rest of the month left substantial snow on the ground through much of the interior of the state well into April. There was widespread concern over the status of such early migrants such as American Woodcock and American Robin, birds that found much of their food supply buried under the snow. It is likely that many perished. However, it should be understood that the advantage of early arrival on the breeding grounds carries the peril of just such weather conditions experienced this season. Birds that succumb in early spring storms are replaced by later migrants, and there were no shortages of woodcocks, phoebes or robins this year!

Precipitation for March was 6.67 inches in the Hartford area, over

State of Connecticut
Department of Environmental Protection

MEMORANDUM

Sue Jacobson, Senior Environmental Analyst — May 27, 2003

From: Min T. Huang, Migratory Gamebird Program Leader

Subject: East Islander Pipeline

Sue,

Per your request, I put together some maps and data on winter distribution of greater scaup, scoter, and oldsquaw in the Long Island Sound (LIS). These were provided to you under separate cover. The data are from the Mid-Winter Inventory surveys that are conducted annually with the United States Fish and Wildlife Service (USFWS). The surveys are conducted from a fixed wing airplane and occur in late December or early January.

Greater Scaup (*Aythya marila*)

Greater scaup breed throughout the tundra and boreal forest of Canada from Hudson Bay west to Alaska. Historically, approximately 64% of the continental population has wintered along the Atlantic coast. Long Island Sound (LIS) has been the major wintering ground for the continental greater scaup population, holding, on average, 53% of the Atlantic coast wintering population.

Continental scaup population numbers have drastically declined over the past 35 years. In Connecticut, wintering numbers have declined from approximately 46,000 in 1967 to an estimated 2,500 in 2002. Causes for the continental decline in scaup are presently unknown.

In LIS, significant numbers of wintering scaup utilize the near shore and off shore habitats from Clinton Harbor west to Sandy Point in New Haven Harbor (Figures 1 and 2). Other areas of importance to wintering scaup include the Norwalk Islands and Greenwich Harbor. Wintering scaup utilize sheltered coves and leeward sides of islands for loafing. Scaup are diving ducks and feed primarily on mollusks, often diving to depths of 25-30 feet.

Figure 1 General distribution of wintering scaup during Mid-winter Inventory, 1998-2002.

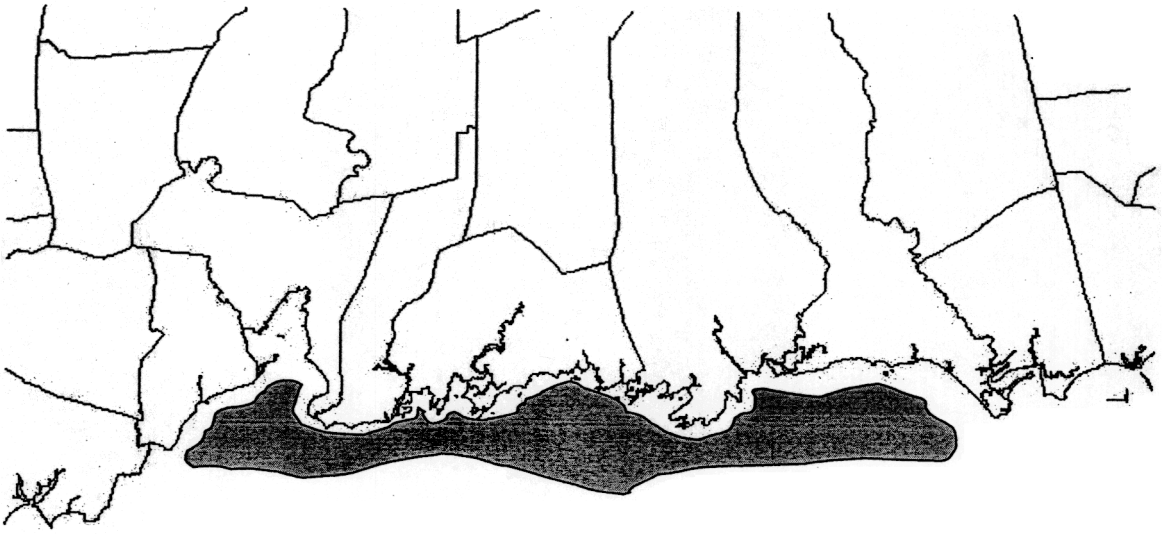
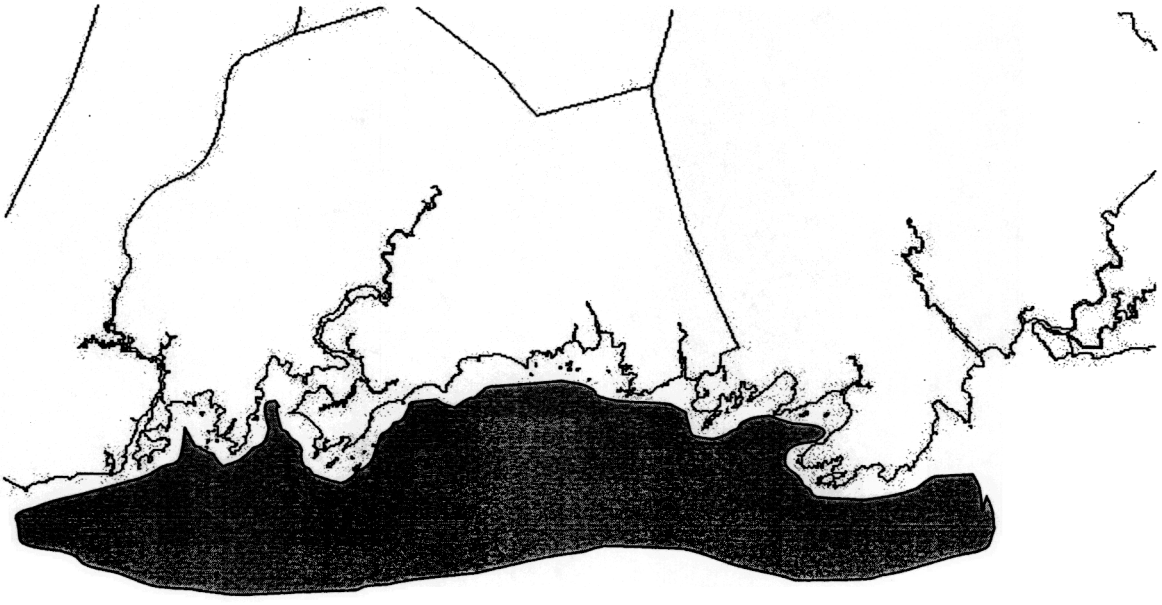


Figure 2. General distribution of wintering scaup during Mid-winter Inventory, 1998-2002.



STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

June 5, 2003

Summary of Map and Data from The Department of Environmental Protection's Natural Diversity Data Base for the Thimble Islands in Guilford & Branford, Connecticut

1. Frisbee Island: Our records indicate that Frisbee Island has a colony of state special concern *Sterna hirundo* (common tern). The terns were first observed in 1984 and were observed nesting on this island through the 1980's. Common terns are colonial nesters. A breeding colony of common terns may range from 10 to 200 or more pairs of nesting birds. This species is vulnerable because of the few colonies present in Connecticut and their sensitivity to human disturbance while in these colonies.

2. Horse Island/Outer Island: Our records indicate that a federal endangered and state endangered *Sterna dougallii* (roseate tern), was known to nest on Horse Island in 1951. Like the common tern, this species is also a colonial nester. The only active colony of roseate terns in Connecticut at the present time is Faulkner Island off the coast of Branford. The roseate tern was listed as a federal endangered species because during the 1980's about 85% of its breeding population occurred on two islands. Currently, in the northeastern U.S., the roseate tern breeds in only a few scattered colonies and over 90% of the population is concentrated on just four islands. Increasing numbers of gulls and human disturbance on islands have reduced nesting habitat for this bird. These small terns are negatively impacted when large, aggressive gulls stake out nesting sites in early spring before the terns return from their wintering areas. Gulls have taken over many islands in Long Island Sound, especially the ones in Connecticut waters.

   There are also two other colonial nesting birds that occur on both Horse Island and nearby Outer Island. *Ardea alba* (great egret) and *Egretta thula* (snowy egret) are both listed as state threatened. These birds were both extirpated from Connecticut during the 1800's but resumed nesting in the 1960's. According to recent colonial water-bird surveys, the number of snowy and great egrets may be stabilizing. They remain vulnerable to human disturbance at their nesting colonies.

3. Bear Island: Our records indicate the presence of state special concern *Opuntia humifusa* (eastern prickly-pear cactus) at Bear Island. The distribution of this cactus species in New England is presently restricted to Connecticut and Massachusetts. Prickly pear cactus prefers dry coastal sands and exposed rocks. Threats include habitat destruction, collection and mowing. Research indicates that this species is losing suitable habitat along the coast.

4. Narrows Island: Our records indicate that this island has an active breeding colony of state special concern *Sterna hirundo* (common tern). This species is vulnerable because of the few colonies present in Connecticut and their sensitivity to human disturbance while in these colonies.

5. Goose Rocks: Our records indicate a historic record for federal endangered and state endangered *Sterna dougallii* (roseate tern) at this small island.

This document involves pipeline location information and is not available at this Internet site due to homeland security-related considerations. This portion of the Islander East consistency appeal administrative record may be reviewed at NOAA's Office of General Counsel for Ocean Services, 1305 East-West Highway, Silver Spring, Maryland.

Natu[illegible]iversity Data Base
State[illegible]ed Species
June 5, 2003

Thi[illegible]Islands
Guilford Branford, CT

ID	Scientific Name	Common Name	Last Observed	Data	Site	Federal ESA	State Protection
1	Sterna hirundo	Common Tern	1989	1989, 19 Pairs of birds. 1986, 31 Pairs of birds. 1984, 76 Pairs of birds.	Frisbee Island		Special Concern
2	Sterna dougallii	Roseate Tern	1951	Historic Record.	Horse Island	Endangered	Endangered
3	Ardea alba	Great Egret	1998	Observed 6 Breeding Pairs, 3 Active Nests And 10 Individuals.	Horse Island/Outer Island		Threatened
4	Egretta thula	Snowy Egret	1989	100 Pairs (Outer Island). 1986, Confirmed Nesting Both Islands.	Horse Island/Outer Island		Threatened
5	Opuntia humifusa	Eastern Prickly-Pear	1993	Plant population observed.	Bear Island		Special Concern
6	Sterna hirundo	Common Tern	1998	Observed 100 Birds, Identified One Active Nest	Narrows Island		Special Concern
7	Sterna dougallii	Roseate Tern	unknown	Historic Record.	Goose Rocks	Endangered	Endangered

Sue Jacobson - waterbirds and shoals image

From: <Andrew_MacLachlan@fws.gov>
To: <susan.jacobson@po.state.ct.us>
Date: 6/16/2003 5:04 PM
Subject: waterbirds and shoals image

June 16, 2003

Susan Jacobson
Office of Long Island Sound Programs
Hartford, CT
susan.jacobson@po.state.ct.us

Susan

In support of your review of a proposed interstate gas transmission pipeline through the Thimble Islands, attached are two JPG images that represent some GIS data we have collected or developed. Note that the waterbird picture includes markers for shorebird breeding sites. These are only represented by American Oystercatchers, and Black Skimmers.

(See attached file: Shoals-Thimbles-map.jpg) (See attached file: Simple-wtrbrd-map.jpg)

I will also send you an image of the harbor seal haul out data when I get it done; I expect by Friday.

If after viewing the JPG images you want copies of the raw GIS data, let me know. Keep in mind these data may not serve the detail or rigor needed for your task and are currently in draft form from our point of view.

Regards,

Andrew MacLachlan, GIS Biologist
U.S. Fish and Wildlife Service
SNE/NYB Coastal Ecosystems Program
PO Box 307
Charlestown, RI 02813
(401) 364-9124 x13

This document involves pipeline location information and is not available at this Internet site due to homeland security-related considerations. This portion of the Islander East consistency appeal administrative record may be reviewed at NOAA's Office of General Counsel for Ocean Services, 1305 East-West Highway, Silver Spring, Maryland.

Colonial Waterbird Areas

Shapefile

Description | Spatial | Attributes

Keywords

Theme: Waterbirds, Birds, Bird Habitat, Bird Collections, Bird Activities, Habitats, Observations, Wetland, Wildlife, Species, Species of Concern, Tern, Plover, Wader, Rail, Bittern, Grebe, Heron, Gull, Rookery, Colony, Egret, Long-legged Waders, Beaches, Mud flats, CT, NY, RI, Seabirds

Place: Long Island Sound, Connecticut, New York, Rhode Island, Peconic Bay, North Shore Long Island, Connecticut River, Long Island, Thimbles, Thames, Stratford

Description

Abstract

This dataset contains polygon units that identify colonial waterbird habitat areas along the coasts of Connecticut, New York and a small portion in Western Rhode Island, near Little Narragansett Bay. Habitat areas were identified by biologists in the spring of 2003. The coastal region within Long Island Sound is the prominent geographic extent for this dataset. This dataset also contains information on the Southern portion of the Connecticut River (from Middletown to the mouth), and the Peconics on the Eastern end of Long Island. The dataset contains information on wading birds such as Great Blue Herons, Egrets, and mixed heronries of intermediate-sized herons. Common and Least Terns, Piping Plovers, Bitterns, Gulls, and Cormorants are also included in this dataset. - Data Are Draft at this time.

Purpose

This dataset is intended to portray approximate colonial waterbird use areas. Some foraging and nesting information is included. The geographic extent is primarily Long Island Sound. The dataset will be used in the development of an Ecological component of the Long Island Sound Stewardship System Study:
LISS Website:
http://www.epa.gov/region01/eco/lis/index.htm
U.S. Fish and Wildlife Service
Southern New England/New York Bight Coastal Ecosystems Program (SNEP) Website:
http://www.fws.gov/r5snep/index.htm

Status of the data

In work

Data update frequency: Unknown

Time period for which the data is relevant

Beginning date and time: 20030501

Ending date and time: 20030630
Description:
publication date

Publication Information
Who created the data: US Fish & Wildlife Service
Date and time: Unpublished Material
Publisher and place: US Fish & Wildlife Service, Charlestown Rhode Island

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Data storage and access information
File name: Waterbirds83
Type of data: vector digital data
Location of the data:
- http://www.fws.gov/r5snep/index.htm

Data processing environment: Microsoft Windows 2000 Version 5.1 (Build 2600) Service Pack 1; ESRI ArcCatalog 8.2.0.700

Accessing the data
Data format: SHP
Size of the data: 0.058 MB
Data transfer size: 0.058 MB
How to decompress the file: ArcView shapefile compressed with WinZip into a self-extracting file.

Constraints on accessing and using the data
Access constraints: Contact USFWS or further information
Use constraints:
Contact USFWS for further information

Details about this document
Contents last updated: 20030714 at time 16100600

Who completed this document
Mark A Engler
USFWS - Southern New England/New York Bight Coastal Ecosystems Program, Charlestown RI
REQUIRED: The mailing and/or physical address for the organization or individual.:
REQUIRED: The city of the address., REQUIRED: The state or province of the address. REQUIRED: The ZIP or other postal code of the address.

401-364-9124 (voice)

Standards used to create this document
Standard name: FGDC Content Standards for Digital Geospatial Metadata

Standard version: FGDC-STD-001-1998
Time convention used in this document: local time
Metadata profiles defining additonal information

- ESRI Metadata Profile: http://www.esri.com/metadata/esriprof80.html

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DEP Wildlife Division
Franklin Swamp WMA
391 Route 32
N. Franklin, CT 06254

Memo

To: Sue Jacobson, Senior Environmental Analyst
OLISP, Hartford

From: Julie Victoria, Wildlife Biologist
Franklin Swamp WMA, N. Franklin

CC: J. Dickson, G. Chasko

Date: May 28, 2003

Re: Thimble Islands

I have been asked to provide wildlife information for the Thimble Island area for DEP-OLISP's use in evaluating the Islander East pipeline project. Every three years since 1986, the DEP Wildlife Division, with the help of many volunteers, monitors the state's waterbird colonies to gather baseline data about species using coastal areas. The objective of the survey is to estimate the number of various breeding waterbird species along the coast. An accurate assessment of the status of these waterbird populations is necessary due to the pressures of recreational use and development in the birds' coastal habitats. The last survey was completed in 2001 and the following 19 areas around the Thimbles were checked. Species abbreviations: DCCO = double crested cormorant, HEGU = herring gull, GBBG = great black-backed gull, AMOY = American oystercatcher (listed as Special Concern), GREG = great egret, WILL = willet (listed as Special Concern), GBHE = green heron. The nesting season for these species extends from April 1 to August 15 and work done near the nests during this timeframe will affect the species.

Location	Species	Species nesting, # Breeding Pairs	# not nesting just loafing
Middle Rocks	DCCO	20	
	HEGU	10	
Spectacle Rock	DCCO	50	
	GBBG	10	
	HEGU	30	
Umbrella Rock			GBBG – 1 HEGU –1 AMOY - 1

Big Mermaid – no birds

Taunton Rock			GBBG – 1 DCCO – 1 GREG - 1
Sumac Island			GBBG – 1 HEGU – 1 GREG -1
Lewis Island			HEGU – at least 1
Andrews Island	GBBG	10	
	HEGU	30	
St. Helena	GBBG	10	
	HEGU	11	
Foot Rocks			DCCO –4 GBBG-2 AMOY-1
White Top	DCCO	33	GBBG-4
	HEGU	15	
Narrows Is. South – no birds			
Narrows Is. North – no birds			
Smith Island	WILL	1	
	HEGU	1	
	AMOY	1	
	GBBG	1	
Hen Island	HEGU	1	
	GBBG	1	
Outer Island	GBHE	1	
	GBBG	1	
Horse Island	GBHE	1	
Frisbie Island	GBBG	7	
	HEGU	10	
Rock next to Belden Island	GBBG	1	

Common_nam	Species_na	Species	Etsprot
GLOSSY IBIS	PLEGADIS FALCINELLUS	GLIB	SC
SNOWY EGRET	EGRETTA THULA	SNEG	T
OSPREY	PANDION HALIAETUS	OSPR	
DOUBLE-CRESTED CORMORANT	PHALACROCORAX AURITUS	DCCO	
GREAT EGRET	CASMERODIUS ALBUS	GREG	T
HERRING GULL	LARUS ARGENTATUS	HERG	
GREAT BLACK-BACKED GULL	LARUS MARINUS	GBBG	
AMERICAN OYSTERCATCHER	HAEMATOPUS PALLIATUS	AMOY	SC
BLACK-CROWNED NIGHT-HERON	NYCTICORAX NYCTICORAX	BCNH	
COMMON TERN	STERNA HIRUNDO	COTE	SC
LEAST TERN	STERNA ANTILLARUM	LETE	T
PIPING PLOVER	CHARADRIUS MELODUS	PIPL	T
GREEN-BACKED HERON	BUTORIDES STRIATUS	GRBE	
WILLET	CATOPTROPHUS SEMIPALMATUS	WILL	
ROSEATE TERN	STERNA DOUGALLI	ROTE	
GREAT BLUE HERON	ARDEA HERODIAS	GBH	
LITTLE BLUE HERON	EGRETTA CAERULEA	LBHE	SC
YELLOW-CROWNED NIGHT HERON	NYCTICORAX VIOLACEUS	YCNH	
CATTLE EGRET	BUBULCUS IBIS	CAEG	SC
SPOTTED SANDPIPER	ACTITIS MACULARIA	SPOT	
BLACK SKIMMER	RHUNCHOPS NIGER	BLSK	

SC = Special concern

T = Threatened

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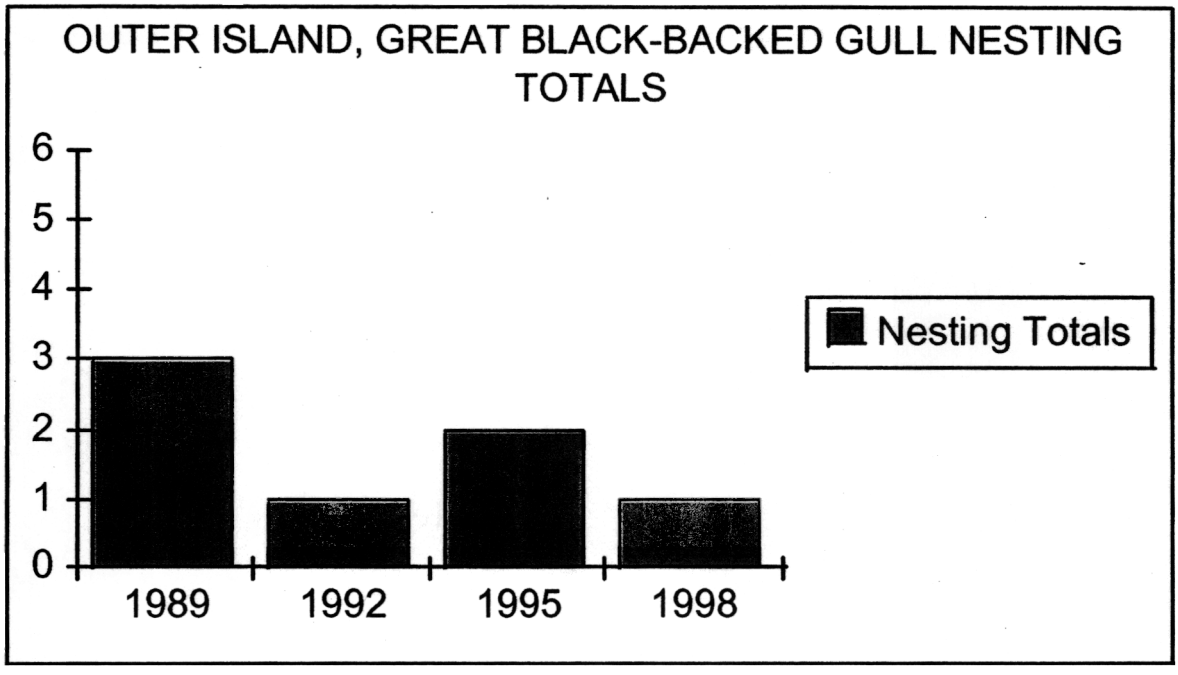
Sample from database



State of Connecticut
Department of Environmental Protection

MEMORANDUM

July 16, 2003

To: Sue Jacobson, Senior Environmental Analyst
Office of Long Island Sound Programs, Hartford

From: Mark Johnson, Senior Fisheries Biologist
Inland Fisheries Division,
Habitat Conservation and Enhancement, Old Lyme

Subject: Request for fisheries information relevant to the Thimble Islands, Branford

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As you requested, this memo provides: 1) a description of commercial and recreational fishing activities in the Thimble Island area of Branford (discussion limited to fisheries and species under the regulatory jurisdiction of the Marine Fisheries Division); 2) a general description of the finfish species and certain invertebrate species that use habitats in the area; and 3) a review of Appendix I, Essential Fish Habitat Assessment, in the Federal Energy Regulatory Commission (FERC) August 2002 Final Environmental Impact Statement (FEIS) for the Islander East Pipeline Project. I understand your request for this information is in response to an appeal filed by the Islander East Pipeline Co. LLC (Islander East) with the Secretary of Commerce. Islander East is appealing your office's finding that their proposal to install a pipeline across the Sound from Juniper Point in Branford to Wading River, Long Island is inconsistent with the Connecticut Coastal Zone Management Act.

Please note that for the purposes of your request I have defined the Thimble Islands area – hereafter referred to as "the Thimbles" – as the area encompassing the intertidal and subtidal habitats from Indian Neck east to Hoadly Point, and as far south as Brown's Reef (Figure 1).

Commercial and Recreational Fishing in the Thimbles

Based on conversations I have had with local fishermen, there are currently three commercial lobster fishermen active in the Thimbles. I discussed with them their current fishing operations as well as historical fishing effort since they all have fished the area in the past, in one case for at least 35 years. All three fish the majority of their gear in the Thimbles. Together, they are allocated 1,000 trap tags (equals 1,000 lobster pots). Combined annual landings for these three fishermen from 1995 to 2002 ranged from 1,591 lbs in 2002 to 9,276 lbs in 1998 (Table 1). Landings in these two years reflect the trend in Sound-wide landings, with record highs building in the late 1990's followed by a rapid decline beginning in the fall of 1999. The decline was a result of a mass mortality of lobsters – primarily in the western portions of Long Island Sound

(LIS) but also affecting the central portions – from causes yet to be determined. In addition to lobster, a few commercial fishermen fish with gillnets for bait species, including Atlantic menhaden, bluefish, and hickory shad.

Several fishermen have told me that historically (back to the 1950's) as many as five lobster fishermen fished the Thimbles at any one time on a full time basis. In addition, approximately 15 other lobstermen have fished the area part time at one time or another. The total number of pots fished at any time is impossible to determine, but appears to have ranged somewhere from 1,000 to 3,000 pots at the peak of the fishery.

I discussed recreational fishing in the Thimbles with Rod MacLeod, Senior Fisheries Biologist in charge of the Marine Angler Survey, and also with several fishermen working the area. Although the amount of effort and harvest cannot be quantified, the diversity and quality of habitat indicates that fishing opportunities for most of the principal recreational species sought after in LIS are good to excellent. In particular, the rocky reef complex just southwest of Outer Island – comprising Brown's Reef, Wheaton Reef, North West Reef, East Reef, and Inner Reef – provide habitat for a variety of fish and therefore excellent fishing opportunities (Jonathan Waters, a Stony Creek shellfishermen, described the area in his December 3, 2002 letter to your office; also, refer to my 12/30 email to you concerning his letter). Typical of other reef complexes in LIS, this area often has a "fleet" of boats on weekends and holidays during the prime fishing periods. In addition, Dick Rocks, Blackstone Rocks and Old Cobble Rocks (also called Commander Rocks) were mentioned as favored fishing spots. In the Thimbles generally, tautog, bluefish, scup and striped bass appear to attract most of the effort, but there are also opportunities for summer flounder, winter flounder, weakfish and black sea bass. In addition, people fish recreationally for lobster around the rocks, reefs and islands, and for blue crab in the tidal creeks within the marshes.

Fish and macro-invertebrate use of habitats within the Thimbles

The Thimbles contains a variety of habitats, including tidal marsh/creek complexes, tidal flats, sedimentary "open bottom" habitats, shellfish beds, and a complex array of islands and rock reefs that provide rocky intertidal and deep-water habitats down to 100+ feet. Due to the diversity of habitats, I expect a variety of fishes can be found in the area. Although comprehensive fisheries surveys of the Thimbles have not been conducted, a list of species that use the area can be developed by evaluating the list of species observed in CT DEP Marine Fisheries Division (MFD) sampling conducted in nearby areas and similar habitats and, as described above, from the types of recreational and commercial fishing taking place in the Thimbles.

The MFD has sampled some of the sedimentary habitats in depths greater than 20' outside the island and reef complex with bottom trawls as part of two broader scale sampling programs: the ongoing Long Island Sound Trawl Survey (LISTS) and a project conducted in the early 90's that assessed the effects of hypoxia on fish abundance and distribution (for details of these surveys, see Simpson et al. 1995 and Gottschall and Pacileo 2002). Dave Simpson, Supervising Fisheries Biologist with the MFD, queried the LISTS database and found that since 1984 ten nearby sites (Figure 1) were sampled a total of 161 times, with a total of 62 finfish species observed (Table

2). Also, the MFD has conducted a Nearshore Seine Survey at eight intertidal sites along the coast (Figure 2) since 1988 (Molnar 2002). Although none of these sites are within the Thimbles, some of the sites contain similar habitats. Since 1988, a total of 54 species were observed (Table 2).

Combining the two lists of species observed in the MFD sampling programs gives a total of 83 species. All of the 83 species could be found at one time or another within the Thimbles, but I would expect 51 of the 83 species would be "regular" members of the fish community, either seasonally or year-round (Table 2). The other 32 species may occur occasionally, but are more typical of other habitats in LIS, the tropics, the Gulf of Maine or the Continental shelf. For a few species there is not enough information to evaluate their occurrence in the Thimbles.

In the following discussion, I will discuss some of the 51 species as they may relate to the different habitats in the Thimbles. Note that without specific fisheries sampling or studies from the area, I am inferring habitat usage from the general body of knowledge of fish ecology in LIS. In order to provide a brief description, I restricted the discussion to the broad habitat types listed above and avoided some of the complexities arising from seasonal distributions and multiple habitat use, particularly by life-stage.

As indicated by recreational anglers, the structure afforded by the islands, submerged rock reefs and smaller rock outcrops provides habitat for a population of tautog, a year-round resident species in LIS that uses the Thimbles for spawning, feeding, and overwintering. Cunner, a relative of the tautog but smaller and generally not targeted by fisheries, is another abundant year-round resident that populates structure. Three other popular recreational and commercial species – bluefish, striped bass, and scup – are very abundant among the reefs and islands at various times during spring through fall, using the area principally for feeding. Schools of bluefish and striped bass move through the area seeking prey, whereas large scup, and to some extent striped bass, tend to remain among the reefs for the season (summer, fall). The structure oriented black sea bass is found in the area from spring through fall, but larger individuals are probably not very abundant since the black sea bass fishery in LIS is primarily an incidental, or by-catch, fishery (MacLeod 2002). Similarly, adult weakfish may also occur around the reefs, but I would not expect significant numbers of adults due to their current, low abundance in the Sound generally (Gottschall and Pacileo 2002). Finally, as indicated by the amount of commercial fishing effort, the area supports a population of lobster, most of which, like tautog, use the area throughout their life cycle on a year-round basis for feeding, spawning and overwintering.

The open bottom, sedimentary habitats (as well as the habitat created by culturing shellfish in these areas) within and around the islands and reefs are utilized by a number of species. Among these, winter flounder and summer flounder are recreationally and commercially important. Winter flounder adults probably forage in the area during late fall, winter, and spring. It is not known if they spawn in the Thimbles. Juveniles can be expected to be present year-round. Summer flounder juveniles and adults can be expected to use the area for feeding from spring through fall. Other benthic fish species that are likely to use the area and may be abundant are: windowpane flounder, flourspot flounder, little skate, hogchoker, grubby, striped searobin, red

hake, smooth dogfish, and silver hake. Less abundant species include: conger eel, winter skate, clearnose skate, northern searobin, northern puffer, fourbeard rockling, smallmouth flounder, spotted hake, and oyster toadfish. It can be expected that all of the species that utilize reefs can also be found over these more open habitats, seeking feeding opportunities.

The nearshore habitats are as varied and complex as the offshore habitats. There are three tidal marsh complexes that contribute to the overall productivity and fish diversity in the Thimbles. Fairly extensive tidal flats exist at the mouths of the creeks, and there are rocky intertidal and shallow water sedimentary habitats. Species that depend to a large degree on salt marshes will be found in these habitats, including mummichog, sheepshead minnow and Atlantic silverside. Other species that generally live out their life cycle in nearshore habitats can be expected, such as striped killifish, northern pipefish, sticklebacks (three-spine stickleback, four-spine stickleback, nine-spine stickleback, and black-spot stickleback), grubby, northern seahorse, and oyster toadfish. Juvenile American eel is probably abundant in the salt marshes and nearshore habitats. Structure oriented fishes such as cunner, juvenile black sea bass and juvenile tautog will use the rocky-intertidal, algae and shell hash for cover. Juveniles of many of the species listed subtidal sedimentary habitats of the Thimbles may be found in the nearshore habitats (e.g. windowpane flounder, winter flounder, and striped searobin), as well as species such as bluefish and striped bass, which will feed opportunistically on smaller prey. Small, little known species that might be found in nearshore habitats (as well as subtidal habitats), and that probably live out their life cycle there, are banded gunnel, rock gunnel, code goby, naked goby, and northern puffer. Three nearshore species – Atlantic tomcod and the anadromous rainbow smelt and white perch – may have resident populations within the Thimbles, but at this time there are no recognized spawning areas or information on their occurrence other than rare observations of white perch and rainbow smelt in LISTS (Table 2). It is possible some life stages of these species may use habitats within the Thimbles on a seasonal basis.

In addition to the species mentioned above, several abundant pelagic species can be found in the Thimbles seeking feeding opportunities. Schools of butterfish would most likely be found passing through the more offshore portions of the Thimbles. Schools of Atlantic menhaden, bay anchovy and the less common striped anchovy might be found passing through habitats ranging from the marshes to the offshore reefs, as would schools of juvenile Atlantic herring. In years when Atlantic herring adults enter the Sound, they might be found in the deeper, more offshore areas of the Thimbles.

Other pelagic species observed in the MFD sampling programs are the anadromous alewife, blueback herring, American shad, and hickory shad. With the exception of perhaps hickory shad, most of these are probably juveniles that are feeding and finding refuge in the various habitats of the Thimbles (either passing through or perhaps remaining for a period of time), or in the case of blueback herring and alewife, are adults that are passing through on their way to spawning streams further to the west. It should be noted that although there is some freshwater input into the tidal marshes (Hoadly Creek probably provides the most flow), there are no documented anadromous spawning runs in the Thimble Island area.

In addition to fish species, a number of invertebrate species observed in the nearby Marine Fisheries trawl samples are sought by commercial and recreational fisheries, and can be expected to populate the Thimbles. As mentioned above, the Thimbles provides extensive, high-quality habitat for lobster. It is likely that many individuals use the area year-round and live out their entire life span in this area. Long-finned squid probably occur seasonally in the deeper open bottom and reef habitats. Horseshoe crab and the two species of whelk inhabiting LIS (channeled and knobbed) are probably year-round inhabitants on open bottom. And finally blue crab, a year-round resident, is abundant in the tidal marshes and can also be found in nearshore and deeper water, sedimentary habitats.

FERC Essential Fish Habitat Assessment

As the Essential Fish Habitat (EFH) assessment is a requirement for federal agencies and employs guidelines established by the National Marine Fisheries Service (NMFS), I will not address the methodology employed by the authors. Rather, I will restrict my comments to the fish species included in the assessment and the appropriateness of the stated conclusions regarding impact to EFH in the proposed pipeline corridor.

Section 4.1 Ecological Notes on the EFH Fisheries and Species.

American plaice: juveniles and adults. The author states that an occasional juvenile or adult may occupy the project area. However, in all likelihood they do not occur in the Sound. The Marine Fisheries Division bottom trawl survey has not observed any since its inception in 1984, and to my knowledge no one has ever observed them in LIS.

Pollock: juveniles and adults. The author states that juvenile and adult Pollock may be in the project area in spring, but in low numbers. I expect the probability of adults occurring in the project is very low, while juveniles can be considered rare. No adults, and only 24 juveniles, were taken in the MFD bottom trawl survey since its inception in 1984.

Summer flounder: juveniles. The description provided by the author is correct. However, I would like to mention that while it appears NMFS has not designated LIS as EFH for adults, LIS is just as important to adults as juveniles.

Whiting: adults. Although the NMFS has not designated LIS as EFH for whiting juveniles, this life-stage does occur in LIS and will occur in the project area.

Bluefish: juveniles and adults. Rather than just summer, both juveniles and adults can be expected in the project area from late spring through fall.

Sandbar shark: larvae and adults. The author states that juvenile and adult sandbar sharks probably occupy the project area. I consider this highly unlikely since only one has been observed in the LISTS since 1984. The reference to larvae is incorrect; typical of sharks, this species gives birth to live young. (Note that the NMFS EFH tables for LIS designate larvae as a category for

this species, but the Guide to EFH Descriptions indicates the category should be "n/a". See http://www.nero.noaa.gov/ro/doc/webintro.html.

Sand tiger shark: larvae. The author states that larvae are likely to occupy the project area. Typical of sharks, sand tiger sharks give birth to live young (see the discussion for sandbar shark). To my knowledge, young-of-year have not been reported in LIS.

Section 5.1 Impacts to EFH

On page 5-2 the authors discuss potential effects of construction on winter flounder eggs and sand lance. While it is true that winter flounder eggs are demersal and therefore particularly susceptible to the types of construction activities proposed by Islander East, it is my opinion that winter flounder do not spawn in the immediate vicinity of the project footprint or within the "impact zone" of suspended sediment. With regard to sand lance, the author's discussion of potential impact is relevant since the construction corridor crosses shallow sandy bottom habitat along the Long Island coastline that is preferred by sand lance. In the nearshore waters on the Connecticut side (Thimble Island area of Branford), however, this type of habitat is largely absent.

Literature Cited

Simpson, D. G., M. W. Johnson and K. Gottschall. 1995. Job 5: Cooperative Interagency Resource Assessment. In: A study of marine recreational fisheries in Connecticut. Annual Rpt. CT DEP Marine Fisheries Division, Old Lyme, CT.135 p.

Gottschall, F. G., D. J. Pacileo. 2002. Job 2 Part 1: Marine Finfish Survey. In: A study of marine recreational fisheries in Connecticut. Annual Rpt. CT DEP Marine Fisheries Division, Old Lyme, CT.174 p.

MacLeod, R. E. 2002. Job 1: Marine Angler Survey. In: A study of marine recreational fisheries in Connecticut. Annual Rpt. CT DEP Marine Fisheries Division, Old Lyme, CT.174 p.

Molnar, D. 2002. Job 2 Part 2: Estuarine Seine Survey. In: A study of marine recreational fisheries in Connecticut. Annual Rpt. CT DEP Marine Fisheries Division, Old Lyme, CT.174 p.

Also referenced:

Letter from Jonathan Waters to Office of Long Island Sound Programs, 12/3/2002.

Email from Mark Johnson to Sue Jacobson, 12/30/02 regarding letter from Jonathan Waters of 12/3/2002

cc:
Peter Aarrestad, Supervising Fisheries Biologist, Inland Fisheries, HCEP (*continued next page*)

Eric Smith, Acting Director, MFD
Dave Simpson, Supervising Fisheries Biologist, MFD
Rod MacLeod, Senior Fisheries Biologist, MFD
Penny Howell, Senior Fisheries Biologist, MFD

TABLES

Table 1. Combined harvest of three commercial lobster pot fishermen in the Thimble Island area, 1995 to 2002.

Year	Weight (lbs)	Trap hauls
1995	4,038	5,971
1996	2,126	5,520
1997	5,488	9,383
1998	9,276	15,817
1999	4,470	12,441
2000	1,916	6,281
2001	1,894	5,502
2002	1,591	4,547

Source: CT DEP Marine Fisheries Information System

Table 2. Fish species observed by CT DEP Marine Fisheries Division offshore bottom trawl surveys in the vicinity of the Thimble Islands since 1984, and in a nearshore Estuarine Seine Survey conducted along the Connecticut coast since 1988.

A total of 62 species were observed in offshore bottom trawl surveys, and 54 species were observed in a nearshore seine survey. Combined, the surveys observed 83 species. The column titled "Survey" indicates if the species was observed in one of the offshore, bottom-trawl surveys (T) or the inshore Estuarine Seine Survey (S).

In the column titled "Occurrence in Thimbles", best professional judgment was used to indicate if a species might be expected to occur regularly (seasonally or year-round) in the Thimbles or occasionally by chance. Species that use the Thimbles on a regular basis are indicated by the qualitative terms "abundant" and "less abundant". "Rare" indicates a species could be observed in the Thimbles, but that it would be an unusual occurrence and not typical of the Thimbles for any of a number of reasons (e.g. the species is more typical of other habitats in LIS, or it is a tropical or colder water species, typically a juvenile transported by prevailing currents). A question mark indicates that a species could be a regular member of the fish community, but not enough information exists to evaluate its occurrence in the Thimbles.

For the species found regularly in the Thimbles, the habitats in which they would be found are listed. Habitat types are coded as follows: TM = tidal marsh; NS = nearshore, or intertidal habitats (e.g. rock and sedimentary intertidal habitats); OB = open bottom in subtidal waters (e.g. sedimentary habitats, cultured shellfish habitat, shell hash); R = rock reefs and other rocky structure.

Common name	Scientific name	Occurrence in Thimbles	Survey
anchovy, bay	*Anchoa mitchilli*	Abundant; TM, NS, OB, R	T, S
anchovy, striped	*Anchoa hepsetus*	Less abundant; OB, R	T
bass, striped	*Morone saxatilis*	Abundant; NS, OB	T
black sea bass	*Centropristes striata*	less abundant; NS, OB, R	T, S
bluefish	*Pomatomus saltatrix*	Abundant; TM, NS, OB, R	T, S
burrfish, striped	*Chilomycterus schoepfi*	Rare	S
butterfish	*Peprilus triacanthus*	Abundant; OB, R	T, S
cod, Atlantic	*Gadus morhua*	Rare	T
croaker, Atlantic	*Micropogonias undulatus*	Rare	T
cunner	*Tautogolabrus adspersus*	Abundant; R, NS	T, S
dogfish, smooth	*Mustelus canis*	Less abundant; OB, R	T, S
dogfish, spiny	*Squalus acanthius*	Rare	T
eel, American	*Anguilla rostrata*	Abundant; TM, less abundant O, R	T, S
eel, conger	*Conger oceanicus*	Less abundant; OB, R	T
filefish, planehead	*Monacanthus hispidus*	Rare	T
flounder, fourspot	*Paralichthys oblongus*	Less abundant; OB	T
flounder, smallmouth	*Etropus microstomus*	Less abundant; NS, OB	T, S
flounder, summer	*Paralichthys dentatus*	Abundant; OB, less abundant NS	T, S
flounder, windowpane	*Scophthalmus aquosus*	Abundant; NS, OB	T, S
flounder, winter	*Pleuronectes americanus*	Abundant; NS, OB	T, S
goby, code	*Gobiosoma robustrum*	Less common, NS	S

goby, code	*Gobiosoma robustrum*	Less common, NS	S
goosefish	*Lophius americanus*	Rare	T
grubby	*Myoxocephalus aeneus*	Abundant; NS, OB, R	T, S
gunnel, banded	*Pholis faxciata*	Less common, NS	S
gunnel, rock	*Pholis gunnellus*	Less abundant; NS	T, S
hake, red	*Urophycis chuss*	Abundant; OB	T
hake, silver	*Merluccius bilinearis*	Abundant; OB	T
hake, spotted	*Urophycis regia*	Less abundant; OB	T, S
herring Atlantic	*Clupea harengus*	Abundant (juvs) OB, R	T
herring - alewife	*Alosa pseudoharengus*	Less abundant; OB, R, NS	T, S
herring, blueback	*Alosa aestivalis*	Less abundant; OB, R, NS	T, S
hogchoker	*Trinectes maculatus*	Less abundant; TM, NS, OB	T, S
jack, crevalle	*Caranx hippos*	Rare	T, S
jack, yellow	*Caranx bartholomaei*	Rare	T, S
killifish, rainwater	*Lucania parva*	Rare (?)	S
killifish, striped	*Fundulus majalis*	Less abundant; NS	S
kingfish, northern	*Menticirrhus saxatilis*	Rare	T, S
lamprey, sea	*Petromyzon marinus*	Rare	T
lizardfish, inshore	*Synodus foetens*	Rare	S
lookdown	*Selene vomer*	Rare	T
mackerel, Atlantic	*Scomber scombrus*	Rare	T
mackerel, Spanish	*Scomberomorus maculatus*	Rare	T
menhaden, Atlantic	*Brevoortia tyrannus*	Abundant; NS, OB, R, TM	T, S
moonfish	*Selene setapinnis*	Rare	T
mullet, white	*Mugil curema*	Rare	S
mummichog	*Fundulus heteroclitus*	Abundant; TM, NS	S
oyster toadfish	*Opsanus tau*	Less abundant; OB, NS, R	T, S
perch, white	*Morone americana*	Rare (?)	T
pipefish, northern	*Syngnathus fuscus*	Less abundant	T, S
Pompano	*Trachinotus carolinus*	Rare	S
puffer, northern	*Sphoeroides maculatus*	Less abundant; NS, OB	T, S
Pumpkinseed	*Lepomis gibbosus*	Rare	S
rockling, fourbeard	*Enchelyopus cimbrius*	Less abundant; OB	T
sand lance, American	*Ammodytes americanus*	Rare	S
scad	*Trachurus lathami*	Rare	T
scup	*Stenotomus chrysops*	Abundant; NS, OB, R	T, S
sea raven	*Hemitripterus americanus*	Rare	T
seahorse, northern	*Hippocampus erectus*	Less abundant; NS (rare, but yr rd)	T, S
searobin, northern	*Prionotus carolinus*	Less abundant; OB	T, S
searobin, striped	*Prionotus evolans*	Abundant; NS, OB	T, S
seasnail	*Liparis atlanticus*	Rare (?)	T
shad, American	*Alosa sapidissima*	Less abundant; NS, OB, R	T, S
shad, gizzard	*Dorosoma cepedianum*	Less abundant; NS, OB, R	T
shad, hickory	*Alosa mediocris*	Less abundant; NS, OB, R	T
sheepshead minnow	*Cyprinodon variegatus*	Abundant; TM, NS	S
silverside, Atlantic	*Menidia menidia*	Abundant, NS, TM, OB	T, S
Silverside, inland	*Menidia beryllina*	Less abundant (rare?); TM, NS	S
skate, clearnose	*Raja eglanteria*	Rare	T
skate, little	*Raja erinacea*	Abundant NS, OB	T, S
skate, winter	*Raja ocellata*	Rare	T
smelt, rainbow	*Osmerus mordax*	Rare (?)	T, S

snapper, grey	*Lutjanus griseus*	Rare	S
spot	*Leiostomus xanthurus*	Rare	T
stargazer, northern	*Astroscopus guttatus*	Rare	S
stickleback, black spot	*Gasterosteus wheatlandi*	Less abundant; TM, NS	S
stickleback, four-spine	*Apeltes quadracus*	Less abundant; TM, NS	S
stickleback, nine-spine	*Pungitius pungitius*	Less abundant; TM, NS	S
stickleback, three-spine	*Gasterosteus aculeatus*	Less abundant; TM, NS	S
stingray, roughtail	*Dasyatis centroura*	Rare	T
tautog	*Tautoga onitis*	Abundant; NS, OB, R	T, S
tomcod, Atlantic	*Microgadus tomcod*	Rare (?)	S
weakfish	*Cynoscion regalis*	Abundant; OB, R	T

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STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Marine Fisheries Division

STATUS OF POPULAR MARINE SPECIES: AMERICAN LOBSTER

IDENTIFICATION: Crustacean with claws on three of five pair of legs. Shell is divided into front carapace and segmented tail. Legal length is measured from the back of the eye socket to the carapace edge just before the tail. Shell color varies from black to dark green.

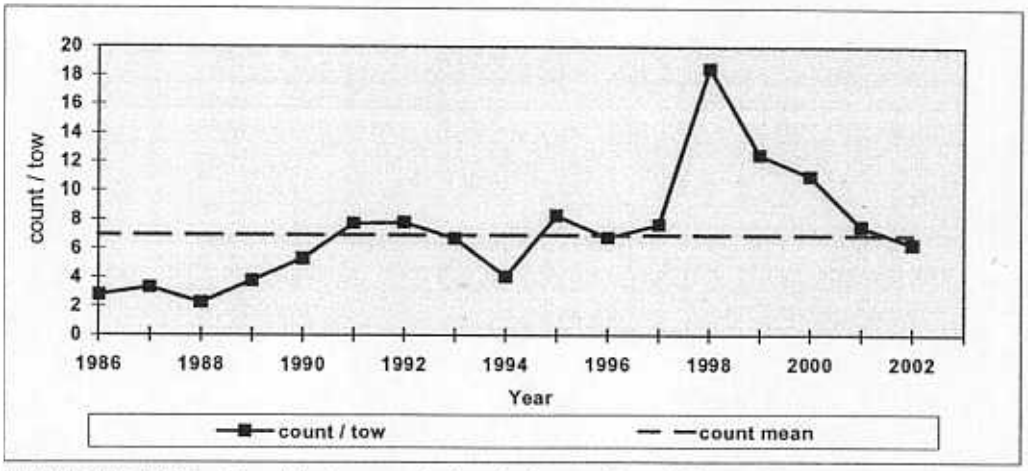
Lobsters are residents of the Sound, especially in the western end. Lobsters in the eastern Sound move in and out through the Race.

Although individual ages have not been determined, DEP catch data indicate that Sound lobsters grow to mature size in 4-5 years, one to two years faster than other populations. Legal size lobsters are believed to be 5-6 years old. DEP has just begun an ageing study to document these ages.

Females carry 5-10 thousand eggs attached to underside of tail, incubating them for 9 months until they hatch. It is illegal to harvest a lobster carrying eggs.

THE FISHERY: The annual harvest of lobster increased steadily over the last two decades, until 1998. Almost all of this harvest is taken by commercial license holders. Connecticut license holders collectively tend over 200,000 lobster traps in the Sound. In 2000 and 2001, 1.3 million pounds of lobster were landed in Connecticut by the commercial fishery, significant drop from a historic high in 1998. Landings and effort (numbers of traps set) dropped in 1999 to 2.59 million lbs following a fall mortality event. In addition, each year 800-1000 people (1,154 in 2001) buy a license to set lobster traps or dive for lobster for personal use (4,121 total pots in 2001). Recreational catch is 2-5% of the total harvest (24,610 lobsters in 2001).

STOCK STATUS: The DEP spring abundance index of lobsters in Long Island Sound increased steadily from 1986 to 1998. The index declined substantially in 1999-2001. This decline was due to a mortality event being investigated at several university and government agencies, including DEP, using funds provided by the National Marine Fisheries Service and CTDEP.



CT DEP Long Island Sound Trawl Survey spring indices of lobster abundance increased steadily from 1986-1998, and declined in 1999-2002.

MANAGEMENT: The lobster population in Long Island Sound is managed as a separate unit under a coastwide management plan developed by the Atlantic States Marine Fisheries Commission. Harvest rates are being re-examined in light of the fact that growth and maturity rates differ in the Sound compared to offshore stocks. Management targets and threshold fishing rates for the Ling Island Sound stock are under review.

HISTORIC PERSONAL HARVEST AND COMMERCIAL LANDINGS IN CONNECTICUT FOR AMERICAN LOBSTER

Year	Personal Use (numbers)	Commercial (pounds)	Commercial (millions of dollars)
1984	105,013	1,796,794	
1985	81,337	1,381,029	*
1986	78,285	1,253,687	*
1987	91,838	1,571,811	*
1988	87,080	1,923,283	*
1989	89,400	2,076,851	6.44
1990	91,212	2,645,951	8.20
1991	95,640	2,673,674	7.33
1992	54,823	2,534,161	6.94
1993	49,414	2,177,022	6.53
1994	40,397	2,149,086	6.44
1995	44,637	2,541,140	7.93
1996	38,625	2,888,683	9.53
1997	61,541	3,468,051	11.03
1998	64,080	3,713,741	12.07
1999	52,384	2,595,764	8.42
2000	21,523	1,393,565	5.50
2001	**24,610**	**1,329,707**	**5.45**

IMPORTANT CONNECTICUT REGULATIONS FOR LOBSTER*

	SPORT	COMMERCIAL
Minimum Length Limit (eye socket to carapace edge)	3-1/4" (egg bearing lobsters must be returned to water unharmed)	3-1/4"
Trap Limit (license and pot tags required)	10	historic use (moratorium on new licenses)
Other Legal Gear	diving, hand harvest	trawl (100 piece limit per day or trip)

*For a complete listing of ALL regulations pertaining to this and other species, refer to the current **CT DEP Anglers Guide page 38**, and CT DEP Commercial Informational Circular.

*For more information, call CT DEP Marine Headquarters at 860-434-6043.

Revision date 1/29/02

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CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

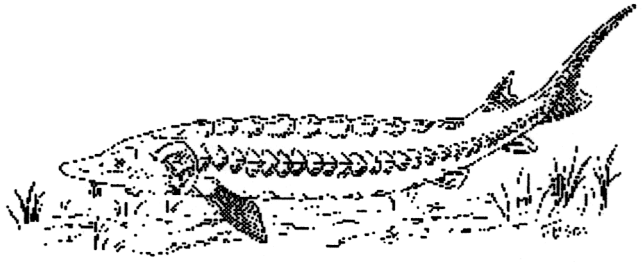
WILDLIFE IN CONNECTICUT

ENDANGERED AND THREATENED SPECIES SERIES

ATLANTIC STURGEON

Acipenser oxyrinchus

THREATENED



THREATENED

Habitat: Main channel of large rivers, estuaries and open ocean.
Weight: Adults, up to 800 pounds.
Length: Adults, up to 12 feet.

Life expectancy: Ages from 50 to 75 years have been reported.
Food: Mollusks, worms, snails, invertebrates, shrimps, small bottom-dwelling fish and insect larvae.
Status: State threatened in inland (fresh) waters.

Identification: Sturgeon are primitive-looking fishes, with a heterocercal tail (the upper lobe is much longer than the lower lobe) and a body covered with 5 rows of large bony plates. These heavy, cylindrical fish have an elongated bony snout, with a tubelike mouth located on the underside of the head. The mouth protrudes several inches when the fish is feeding. The Atlantic sturgeon ranges in color from brownish-gray to blue-black on the back and upper side, shading to white on the belly.

Any sturgeon found in Connecticut waters that is more than 4 feet long is an Atlantic sturgeon. Atlantic sturgeon can be distinguished from shortnose sturgeon by their relative mouth width. Atlantic sturgeon have mouth widths (inside the lips) that measure less than 50 percent of the distance between the eyes, while shortnose sturgeon have large mouths that measure greater than 60 percent of the distance between the eyes.

Range: Atlantic sturgeon range along the entire east coast of North America, from the St. John River in New Brunswick, Canada, to the St. Johns River along the east coast of Florida. A separate subspecies, the gulf sturgeon, is found along the west coast of Florida and throughout the Gulf of Mexico. Atlantic sturgeon native to Connecticut waters are believed to be extinct.

Reproduction: Atlantic sturgeon are anadromous, entering large freshwater river systems to spawn during the spring. Only a few states still have spawning populations of the Atlantic sturgeon. The Hudson River in New York has the only spawning population in New England.

Reason for Decline: Populations of Atlantic sturgeon have declined due to overfishing, loss of habitat, limited access to spawning areas and water pollution.

History in Connecticut: Atlantic sturgeon once supported a commercial fishery in the Connecticut River, but the lack of reliable records makes it difficult to estimate the size of the population at that time.

Interesting Facts: Sturgeon are among the oldest living species of fish. They have retained many primitive characteristics, suggesting what fish may have looked like during the age of the dinosaurs. The almost two dozen species of sturgeon can only be found in the Northern Hemisphere. Seven of these species occur in North America.

During the summer, juvenile Atlantic sturgeon can occasionally be found in the lower portions of the three major rivers in Connecticut. However, these are sexually immature fish from the Hudson River that only stay a few months before heading back out to sea.

The size of Atlantic sturgeon at sexual maturity is approximately 6 feet. Age at that size varies by sex and latitude. Females are generally older than males of a similar size and are thought to live longer and grow larger than males.

Atlantic sturgeon of all sizes are seen or captured in Long Island Sound. The Sound may be an important feeding or resting area on the way to and from spawning areas. Occasionally adult-sized (6 or more inches) sturgeon are seen in the rivers of Connecticut. It is believed that these fish are simply foraging or perhaps lost, having made a wrong turn.

Sturgeon are occasionally seen jumping clear out of the water (breaching). It is unknown why sturgeon breach, although it has been suggested that they may be attempting to rid themselves of parasites.

Protective Legislation: *State* - Connecticut General Statutes Sec. 26-112-45(1) and 26-311

What You Can Do: Some sturgeon are unnecessarily killed by people wanting to learn the identity of the fish. Become familiar with various fish species by consulting identification keys and pictures before going fishing. Return all live sturgeon to the water after capture. All dead specimens should be reported to the DEP Fisheries Division. If you catch or observe a sturgeon, please report it to the Marine Office (203-434-6043). It is illegal to keep any Atlantic sturgeon taken in inland waters. Atlantic sturgeon larger than 6 feet that are seen in inland waters may be attempting to return to spawning areas and should not be disturbed.

The production of this Endangered and Threatened Species Fact Sheet Series is made possible by donations to the Endangered Species-Wildlife Income Tax Checkoff Fund.
(rev. 12/99)

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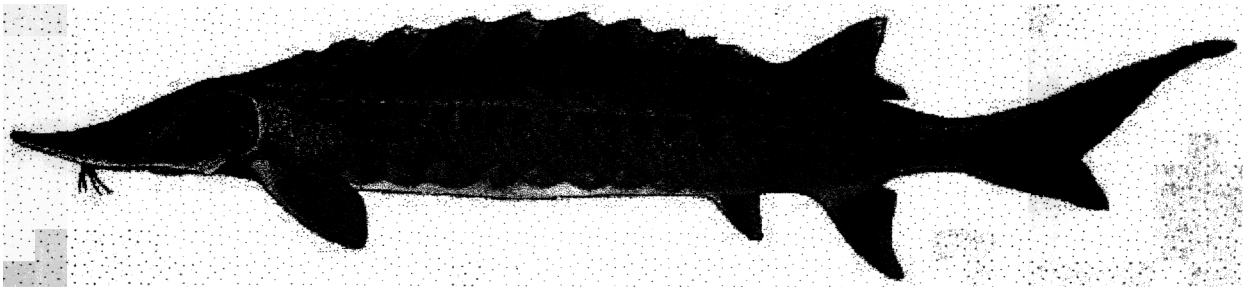
U.S. Fish & Wildlife Service

Connecticut River Coordinator's Office

Restoring Migratory Fish to the Connecticut River Basin

Migratory Fish | Documents | Who's Who | How to Help | CRC Home

Fish Facts - Atlantic Sturgeon



Description | **Life History** | **Distribution** | **Status** | **Restoration Efforts**

Description

The Atlantic sturgeon *(Acipenser oxyrhynchus)* is one of two sturgeon species in the Connecticut River; the other is the shortnose sturgeon. The Atlantic sturgeon looks similar to the shortnose sturgeon, but has a longer snout and is much, much larger. Adult Atlantic sturgeon adults are tremendous in size, averaging 6 to 10 feet in length and 50 to 200 pounds in weight. Atlantic sturgeon are olive to black dorsally shading to white below. Sturgeons are an ancient species with fossils dating back 65 million years. They are very distinctive, looking like a prehistoric cross between a shark and a catfish. Sturgeons lack teeth and scales but have a unique body armor of diamond-shaped bony plates called scutes.
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Life History

Atlantic sturgeon are anadromous, migrating from the ocean to fresh water specifically to reproduce. Atlantic sturgeon reproduce in the spring, broadcasting one million to two and a half million eggs per female. After hatching, the young sturgeon stay in the river for 2 to 7 years before migrating to the ocean. (Return to top)

Distribution

Atlantic sturgeon can be found along the east coast of North America from Canada to Florida. In the Connecticut River basin, a small number of individuals are found in the Connecticut River mainstem in Connecticut. (Return to top)

Status

Atlantic sturgeon are listed as threatened by the State of Connecticut. There are in fact fewer Atlantic sturgeon in the Connecticut River than shortnose sturgeon, which is endangered on a national level. The Connecticut River population was nearly wiped out by over-harvesting and pollution during the 1800's and 1900's. Sturgeon were harvested heavily for meat, skin (for leather), the swim bladder (used to make a gelatin for waterproofing, cement, and wine-making), and their eggs (roe), which were prized as caviar. Because there are very few individuals left and likely no spawning activity occurring, the Connecticut River Atlantic sturgeon probably do not represent a true population. Though it is strictly regulated, this sturgeon species is still commercially harvested in other areas. (Return to top)

Restoration Efforts

Along the east coast, several States have closed their Atlantic sturgeon fisheries, and other States have raised the size limit to 7 feet. There is some rearing being done in hatcheries. These hatchery fish have been used to boost wild populations in the Hudson River. Research is also being conducted to determine the migration routes of Atlantic sturgeon. (Return to top)

Migratory Fish Documents Who's Who How to Help CRC Home

U.S. Fish and Wildlife Service

This page was last updated on 10/30/2001 11:59:04

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From: Mark Johnson
To: Sue Jacobson
Date: 12/30/02 10:50AM
Subject: Jonathan Waters re Thimble Island reefs

Sue:
Thanks for faxing to me the letter your office received from Jonathan Waters (a shellfishermen operating in the Thimble Island area of Branford) on December 3, 2002. You had asked me to read it and offer my impressions of his description of an area that includes four reefs in the Thimble Island area. Although not stated in the letter, I understand he sent it to you out of concern for the impacts that could occur if the Islander East Pipeline were constructed. I spoke with Mr. Waters on December 12, 2002 about his letter. I also discussed it with several of our marine fishery biologists: Penny Howell, Lobster Investigations; Kurt Gottschall, LIS Trawl Survey; Rod MacLeod, Recreational Fisheries; and David Simpson, Supervising Fisheries Biologist.

The area described by Mr. Waters is bounded by Inner Reef, Northwest Reef, Browns Reef and East Reef. He considers these reefs to be "a dynamic area of diverse benthic character", and goes on to describe the "complex benthic structure". The area is considered to be an "important nursery area for juvenile lobsters", provides "shelter and habitat for a variety of shellfish and finfish and are perceived to an area of over winiering for juvenile lobsters and fish such as tautog", and has "traditionally supported a local lobster fishery for the last hundred years at least". To further demonstrate that these reefs "team with life", he describes the "prevalence of lobster gear in the summer and fall runs and the numerous striped bass and bluefish that are taken there spring thru fall".

I asked Mr. Waters why in his letter he singled out this area as opposed to the many other reefs and Islands in the Thimble Island area. He explained that in general the Thimble Island area is important to marine life, but that the area he described, and Brown's Reef in particular, tends to have the highest concentration of fishing activity due to the numerous lobsters and fish that use the area. As he stated, he believes it is the greater structural complexity of the area that renders it generally more productive than other reefs in the Thimble Island/reef complex. Also, Mr. Waters, who is a long-time resident of Stony Creek and fisherman (he "lived here most of my life", and has been primarily involved in shellfishing), based some of his comments, such as the value of the area as a nursery and over-wintering area for lobsters, on his conversations with the "old timers" who have historically fished for lobsters and finfish throughout the Thimble Islands.

Although, fisheries surveys have not been conducted in the Thimble Island/reef complex, we generally agree with Mr. Waters' assessment. Reefs provide good habitat for lobster and tautog as well as a variety of other fishes. Examination of nautical charts shows that the area, as described by Mr. Waters, is structurally more complex than other areas within the Thimble Islands, and is therefore probably more productive and used by greater numbers of fish and lobsters. This conclusion is further supported by the greater amount of recreational fishing--and commercial lobster fishing based on Mr. Waters' accounts--that takes place there compared to other locations within the Thimble Islands.

With regard to some of Mr. Waters' more specific descriptions of how fish and lobsters use the reefs, such as the area is "considered an important nursery area for lobsters", and is "perceived to be an area of over wintering for juvenile lobsters and fish such as tautog", again we have no data specific to the area that would prove or disprove these perceptions. Mr. Waters rightfully qualifies these statements with the words "perceived" and "considered" because they are inferred from fishing practices as opposed to direct observation and study. However, lobsters and tautog, as well as some other fishes, do use reef habitat for these purposes, so he could be correct in his assertions. Moreover, for the purpose of protecting the reefs from degradation, it would be appropriate to list these as possible functions that the reef habitat affords to fishes and lobster.

If you have any other questions, please feel free to call.

mj

Thimble Island Shellfish Inc.
269 Thimble Island Road
Stony Creek, Connecticut 06405
203-481-0898

December 3, 2002

The reef area west south west of the Thimble's Outer Island encompassing Inner Reef, Northwest Reef, Brown's Reef and East Reef is a dynamic area of diverse bethnic character as important to the ecology of Long Island sound as the near shore, marshes and wetlands of the Connecticut shore.

This area has traditionally supported a local lobster fishery for the last hundred years at the least. It is considered an important nursery area for juvenile lobsters, which at this point in time is vitally important in light of the lobster mortality in Long Island Sound. The Reefs provide shelter and habitat for a variety of shellfish and fin fish and are perceived to be an area of over wintering for juvenile lobsters and fish such as tautog. The reefs have a complex bethnic structure which varies in depth from awash to one hundred feet deep and everything in between with peaks and valleys probably not unlike similar geologic structures on the near shore. This structure provides numerous nooks and crannies which attract fish and shellfish. The reef creates eddying currents, which concentrates food brought down by the tide forming an elaborate and unique ecosystem within its structure. Not only does the reef offer opportunities for food, its intricate cavities offer protection from predators that make up the food chain.

Compared to the relatively static, plane like areas surrounding this area to the west,south and east the reef teams with life. This is simply observed by the large recreational fishery for tautog in the fall and early winter, the prevalence of lobster gear in the summer and fall runs and the numerous striped bass and bluefish that are taken there spring thru fall.

Enclosed please find a chart of the area described, with latitude and longitude of the corners.

Thank you, Jonathan Wilcox

Inner Reef Can	C "5"	41° 14.534' N 72° 46.058' W
Northwest Reef Nun	N "2nw"	41° 14.085' N 72° 46.621' W
Brown's Reef Bell	R "26"	41° 13.807' N 72° 46.261' W
East Reef Can	C "1"	41° 13.971' N 72° 45.818' W

This document involves pipeline location information and is not available at this Internet site due to homeland security-related considerations. This portion of the Islander East consistency appeal administrative record may be reviewed at NOAA's Office of General Counsel for Ocean Services, 1305 East-West Highway, Silver Spring, Maryland.

The Maritime Aquarium
AT NORWALK

June 20, 2003

Susan Jacobson
Office of Long Island Sound Programs
79 Elm ST
Hartford, CT 06106-5127

Dear Ms. Jacobson:

The population of seals overwintering in Long Island Sound includes five species: harbor, gray, harp, hooded and ringed. Both species of pinnipeds are recolonizing Long Island Sound as their population increases in New England. In addition, both species overwinter in LIS with a few individuals remaining year round. The exact time of arrival and departure for seals in the Thimble Islands is unknown. In general, seals appear in October and remain through April in Connecticut.

During the two aerial surveys I conducted this past winter, I have observed harbor and gray seals off Outer Island. On 2/14/03, four seals were observed during minimal weather conditions. Interestingly, only six additional seals were counted that day in Norwalk and Stamford. Seals were not seen at other locations along the Connecticut coastline of western LIS. On 3/1/03 with lighter winds and calmer seas, 44 seals were observed off Outer Island. Additional seals were seen at Faulkner's and Goose Island. I have enclosed three pictures from the Thimble Islands taken from the plane during that survey.

Harbor and gray seals haulout on rocks that are exposed during low tide. Seals commonly haulout to rest and thermoregulate. The large groups they form at these haulouts are a form of predator protection. Along the Connecticut shore, seal haulout sites occur at a few very specific locations. The Thimble Islands are one of the larger haulout sites in Connecticut. Similar to the Norwalk Islands, the Thimble Islands have suitable habitat for seals including an increased degree of isolation from human activity during the winter, large accessible rocks enabling seals to form large groups, and immediate access to deep water to escape from a perceived threat. In addition, I have only observed gray seals in four locations in Connecticut including Outer Island. The other three locations are Faulkner's, Goose and Sheffield Island.

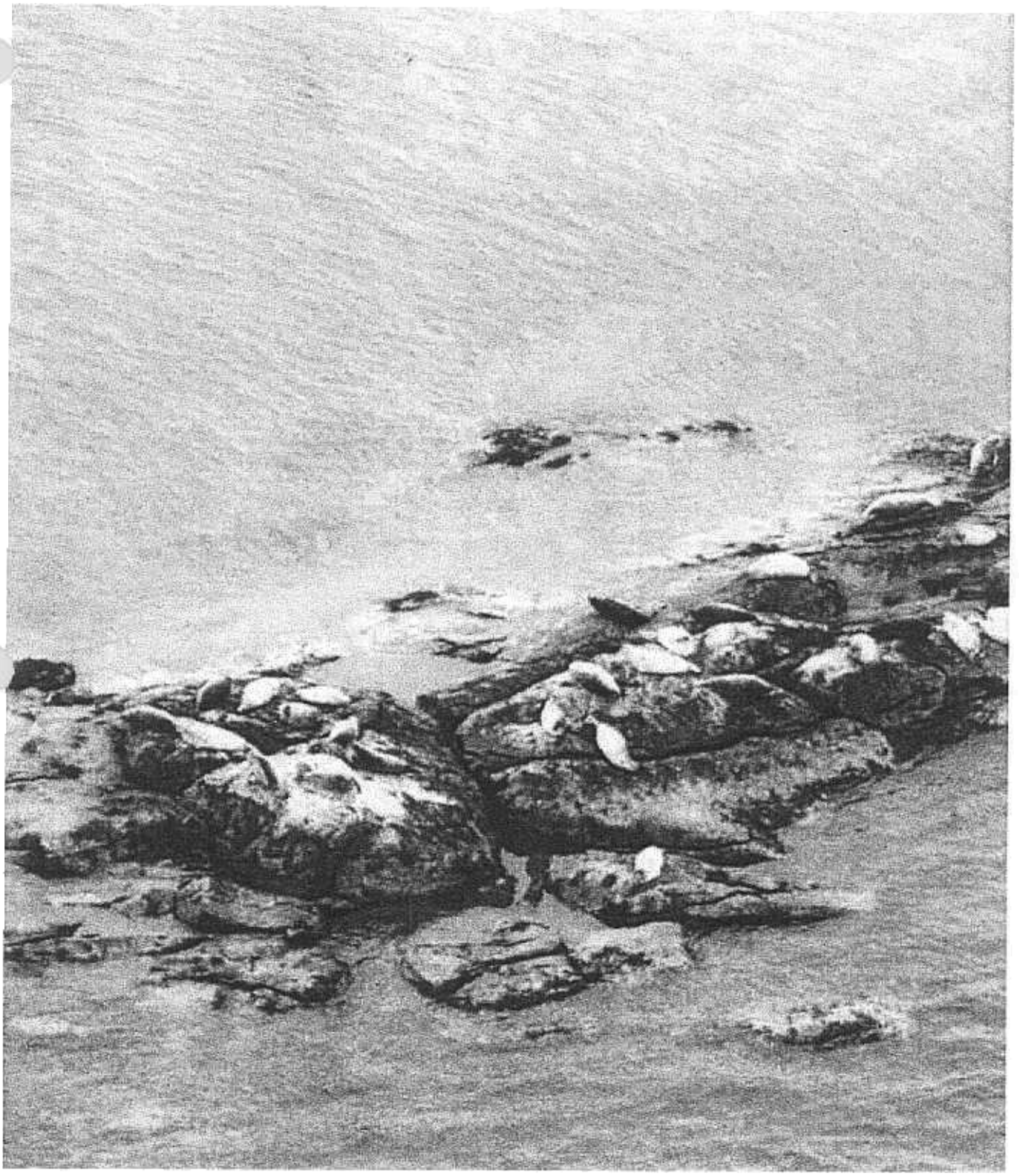
Harbor seals give birth in mid-May to mid-June primarily in Maine. It can be assumed that pregnant females will be present at the Thimble Islands during the winter. In addition, gray seals give birth on the shoals off Nantucket in January. There is a possibility of weaned grey seal pups hauling out in Branford. They have been observed in Norwalk.

Seals eat a variety of prey including fish, skate and squid. Preliminary results from scat samples collected at Great Gull Island in New York indicate that seals in the eastern Sound eat primarily red hake.

Feel free to contact me if you require additional information.

Sincerely,

Amy Ferland
Harbor Seal Census Researcher



Ferland*, A.; M.B. Decker, A. Karagic, M. MacBruce, F. Watson, and J. Puglisi, The Maritime Aquarium at Norwalk, 10 North Water St., Norwalk, CT 06854, Department of Ecology and Evolutionary Biology, Yale University, New Haven, CT 06520-8106, Wilbur L. Cross High School, 181 Mitchell Dr., New Haven, CT 06511.

HARBOR SEALS IN LONG ISLAND SOUND: A SURVEY OF POTENTIAL HAUL OUT SITES AND EFFECTS OF HUMAN DISTURBANCE ON BEHAVIOR

Long Island Sound is an important over-wintering site for North Atlantic populations of harbor seals (*Phoca vitulina concolor*). The abundance of harbor seals in Long Island Sound is increasing. However, the number of protected haul-out sites is limited and human activities along the densely-populated shoreline have the potential to disturb harbor seals from their haul-outs. Haul-out sites are important areas for harbor seals to rest and thermoregulate. Surveys of potential haul-out sites and weather-related hauling-out patterns were conducted from 1996 to 2002 in Norwalk, Connecticut. The results of this study provide evidence that harbor seals are selective of their haul-out site habitat. Of the sixteen islands and reefs surveyed, only two locations, Sheffield Island Ledges and Smith Reef, were used by seals as haul-out sites in Norwalk. This study also illustrated the influence that weather conditions, particularly wave height and wind speed, have upon the number of seals hauled-out. In addition, observations were conducted in order to determine if human activities near haul-outs affected harbor seal behavior. Observations were made during ground-based surveys and from boats that remained at least 200 m from the haul-outs. Seals showed signs of disturbance by human activities that occurred at distances as great as 160 m. Small boats that approached within 60 m of a haul-out caused seals to flush from the rocks. Repeated disturbance from haul-outs may cause harbor seals to abandon a site. Long-term surveys suggest that harbor seals may have abandoned haul-outs near Norwalk Harbor due to increased boat traffic.